



Volunteer Lake Assessment Program Individual Lake Reports

RUSSELL RESERVOIR, HARRISVILLE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	7,031	Max. Depth (m):	4.7	Flushing Rate (yr ⁻¹)	93.5
Surface Area (Ac.):	26	Mean Depth (m):	1.6	P Retention Coef:	0.14
Shore Length (m):	1,900	Volume (m ³):	170,000	Elevation (ft):	1160

TROPHIC CLASSIFICATION

Year	Trophic class
1988	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

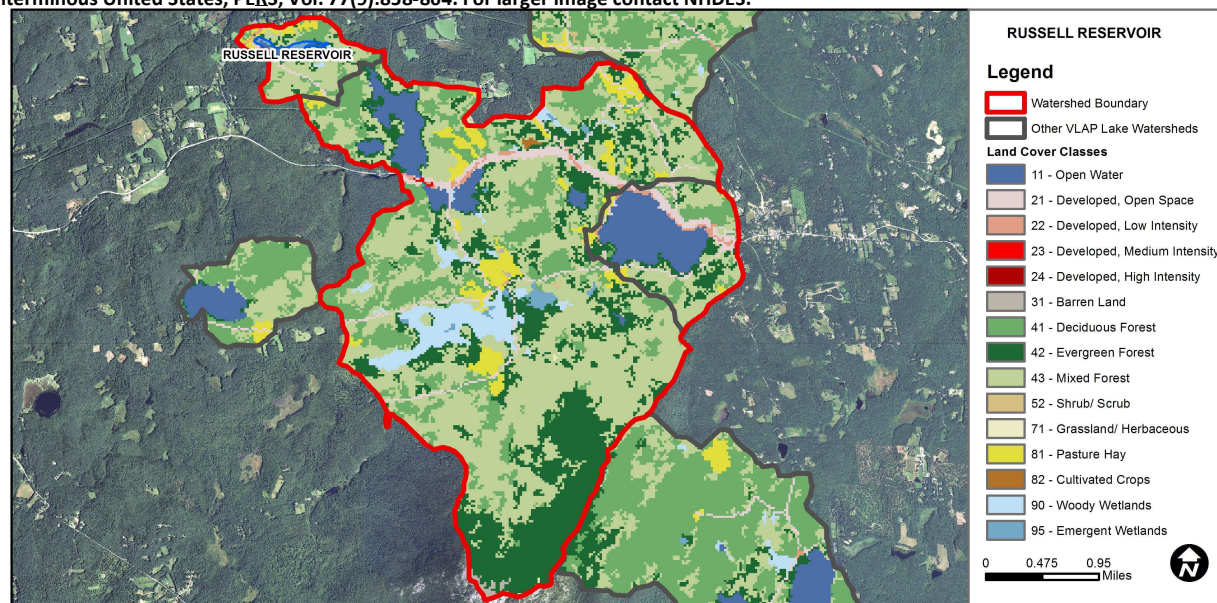
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geometric mean. No single sample exceedances. More data needed.
	Chlorophyll-a	Encouraging	< 10 samples and no exceedance of criteria. More data needed.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

RUSSEL RESERVOIR - CHESHAM BEACH	E. coli	Bad	>=1 exceedance(s) of geometric mean criterion and/or >=2 exceedances of single sample criterion, with 1 or more >2X criteria.
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WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.9	Barren Land	0.31	Grassland/Herbaceous	0.04
Developed-Open Space	3.72	Deciduous Forest	16.16	Pasture Hay	4.48
Developed-Low Intensity	0.64	Evergreen Forest	22	Cultivated Crops	0.08
Developed-Medium Intensity	0.04	Mixed Forest	40.66	Woody Wetlands	3.77
Developed-High Intensity	0	Shrub-Scrub	0.05	Emergent Wetlands	0.78



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2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphic)

- 🔥 **CHLOROPHYLL-A:** Chlorophyll levels have increased since 2007. The 2012 levels were the highest measured since monitoring began and were slightly greater than the NH lake median.
- 🔥 **CONDUCTIVITY/CHLORIDE:** Conductivity levels were low in 2012 and approximately equal to the NH lake median.
- 🔥 **TOTAL PHOSPHORUS:** Epilimnetic (deep spot) phosphorus levels decreased slightly from 2011 and were approximately equal to the NH lake median. Epilimnetic phosphorus has generally increased steadily since 2007 which would explain the increased algal growth. Inlet phosphorus was slightly higher in 2012, and Beach phosphorus was also slightly high.
- 🔥 **TRANSPARENCY:** Transparency decreased slightly in 2012 likely due to the increased algal growth. Historical trend analysis indicates a stable transparency since monitoring began.
- 🔥 **TURBIDITY:** Turbidity levels were generally higher than normal in 2012 likely due to low water levels and stream flow.
- 🔥 **pH:** pH levels were lower than desirable.
- 🔥 **RECOMMENDED ACTIONS:** The increasing phosphorus and chlorophyll levels are concerning. Efforts should be made to educate watershed residents on ways to manage phosphorus loading to the pond through eliminating fertilizer usage, and reducing stormwater impacts from their properties, driveways and dirt roads. Utilize DES' "Homeowner's Guide to Stormwater Management" as a resource.

Station Name	Table 1. 2012 Average Water Quality Data for RUSSELL RESERVOIR						
	Alk.	Chlor-a	Cond.	Total P	Trans.		pH
	mg/l	ug/l	uS/cm	ug/l	m		
					NVS	VS	
Beach			39.1	17			1.86
Deep Epilimnion	1.7	5.49	39.3	12	1.87	2.37	1.31
Inlet			39.6	15			1.28
Outlet			39.0	11			1.44

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m³

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: < 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	N/A	Ten consecutive years of data collection necessary to determine trends.
Transparency	Stable	Data not significantly increasing or decreasing.
Phosphorus (epilimnion)	N/A	Ten consecutive years of data collection necessary to determine trends.

This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact:
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